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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

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July 1970
U.S. Training and
Employment Service
Technical Report
S-329

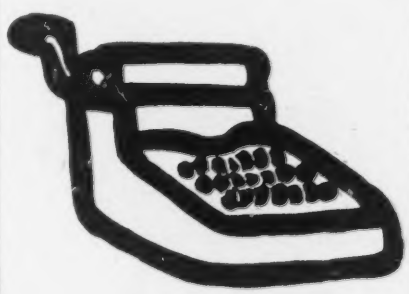
Development of USTES

APTITUDE TEST
BATTERY FOR

CLERK, GENERAL OFFICE

(clerical)
219.388

U.S. DEPARTMENT OF LABOR
Manpower Administration



TM 001 925

Technical Report on Development of USTES Aptitude Test Battery

For . . .

Clerk, General Office (clerical) 219.388

S-329

(Developed in Cooperation with the Ohio,
Pennsylvania and Minnesota State Employment Services)

U.S. Department of Labor
Manpower Administration

July 1970

FOREWORD

The United States Training and Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

GATB Study#2188, 2490, 2800

Development of USTES Aptitude Test Battery

For

Clerk, General Office (clerical) 219.388-066

S-329

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Clerk, General Office (clerical) 219.388-066.

GATB Aptitudes	Minimum Acceptable GATB Scores
G - General Learning Ability	95
V - Verbal Aptitude	90
N - Numerical Aptitude	90
Q - Clerical Perception	110

RESEARCH SUMMARY

Sample: 198 (10 male and 188 female) workers employed as Clerks, General Office by various companies in Ohio.

This study was conducted prior to the requirement of providing minority group information. Therefore, minority group status is unknown.

Criterion: Supervisory ratings.

Design: Concurrent (test and criterion data were collected at approximately the same time).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, aptitude-criterion correlations and selective efficiencies.

Concurrent Validity: Phi Coefficient = .18 ($P/2 < .005$)

Effectiveness of Norms: Only 65% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 71% would have been good workers. Thirty-five percent of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 29% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	65%	71%
Poor Workers	35%	29%

SAMPLE DESCRIPTION

Size: N = 198

Occupational Status: Employed Workers.

Work Setting: Workers were employed by various companies in Ohio.

Employer Selection Requirements:

Education: None required.

Previous Experience: None require.

Tests: USES aptitude test battery B-3.

Principal Activities: The job duties for each worker are comparable to those shown in the job description in the Appendix.

Minimum Experience: All workers in the final sample had at least two months job experience.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience N = 198

	Mean	SD	Range	r
Age (years)	27.6	9.6	18-61	.069
Education (years)	12.4	1.1	10-16	-.028
Experience (months)	40.5	52.3	1-342	.268**

**Significant at the .01 level.

EXPERIMENTAL TEST BATTERY

All tests of the GATB, B-1002A, except Parts 9-12 were administerd during the period April 1 to May 30, 1957.

CRITERION

The criterion data consisted of supervisory ratings of job proficiency made at approximately the same time as the tests were administered The immediate supervisor rated each worker.

Rating Scale: USES Form SP-21 "Descriptive Rating Scale" was used. The scale (see Appendix) consists of nine items covering different aspects of job performance. Each item has five alternative responses corresponding to different degrees of job proficiency.

Reliability: Since only one rating was obtained, no reliability data is available.

Criterion Distribution:

Possible Range	9-45
Actual Range	18-45
Mean	34.0
Standard Deviation	5.0

Criterion Dichotomy: The criterion distribution was dichotomized into low and high groups by placing 35% of the sample in the low group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers." The criterion critical score is 33.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of job duties involved and a statistical analysis of test and criterion data. Aptitude K which does not have a high correlation with the criterion, was considered for inclusion in the norms because the qualitative analysis indicated that this aptitude might be important for the job duties and the sample had a relatively high mean score on this aptitude. Tables 3, 4 and 5 show the results of the qualitative and statistical analyses.

TABLE 3

QUALITATIVE ANALYSIS

(Based on the job analysis, the aptitudes indicated appear to be important to the work performed.)

Aptitude	Rationale
G - General Learning Ability	Required in understanding oral and written instructions and to learn and perform the varied duties of the jobs.
V - Verbal Aptitude	Required in understanding the meaning and relationship of words and sentences, and in learning rules of grammar and punctuation.
N - Numerical Aptitude	Required in performing computational work.
Q - Clerical Perception	Required in reading and recording numbers and names quickly and accurately, in filing letters, in preparing records and reports, and in posting data.
K - Motor Coordination	Required in filing and sorting, and in performing various office machine operations.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N=198

Aptitude	Mean	SD	Range	r
G - General Learning Ability	107.7	14.0	68-143	.262**
V - Verbal Aptitude	108.5	15.0	74-158	.223**
N - Numerical Aptitude	111.3	14.0	77-150	.228**
S - Spatial Aptitude	100.7	18.1	58-163	.067
P - Form Perception	113.7	17.1	66-155	.058
Q - Clerical Perception	123.4	15.4	86-172	.152*
K - Motor Coordination	117.0	15.3	82-165	.043

*Significant at the .05 level.
**Significant at the .01 level.

TABLE 5

SUMMARY OF QUALITATIVE AND QUANTITATIVE DATA

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X	X	X			X	X		
Irrelevant									
Relatively High Mean					X	X	X		
Relatively Low Standard Dev.	X		X						
Significant Correlation with Criterion	X	X	X			X			
Aptitudes to be Considered for Trial Norms	G	V	N			Q	K		

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the bais of the degree to which trial norms consisting of various combinations of aptitudes G, V, N, Q and K at trial cutting scores were able to differentiate between the 65% of the sample considered to be good workers and the 35% of the sample considered to be poor workers. Trial cutting scores at five-point intervals approximately one standard deviation below the mean are tried because this will eliminate about one-third of the sample with three-aptitude norms. For four-aptitude trial norms, cutting scores of slightly less than one standard deviation below the mean will eliminate about one-third of the sample; for two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of G-95, V-90,

N-90 and Q-110 provided optimum differentiation for the occupation of Clerk, General Office (clerical) 219.388-066. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .19 (statistically significant at the .005 level).

TABLE 6

Concurrent Validity of Test Norms
G-95, V-90, N-90 and Q-110

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	31	97	128
Poor Workers	30	40	70
Total	61	137	198

Phi Coefficient = .18
Significance Level = P/2 $<$.01

Chi Square (X^2) = 6.5

DETERMINATION OF OCCUPATION APTITUDE PATTERN

The data for this study met the requirements for incorporating the occupation studies into OAP-17 which is shown in the 1970 edition of Section II of the Manual for the General Aptitude Test Battery. A Phi Coefficient of .16 is obtained with the OAP-17 norms of G-90, V-90, Q-100.

CHECK STUDY RESEARCH SUMMARY SHEET FOR S-329

S-329 GATB Study #2490
Clerk, General Office (clerical)
219.388-066
Check Study#1 Research Summary

Sample:

103 (9 male and 94 female) workers employed as Clerk, General Office in five employers in Pennsylvania.
This study was conducted prior to the requirement of providing minority group status. Therefore, minority group composition is unknown.

TABLE 7

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, Experience and Aptitudes of the GATB N=103

	Mean	SD	Range	r
Age (years)	29.7	10.5	18-53	.425**
Education (years)	12.0	.8	7-15	.008
Experience (months)	61.4	74.5	3-348	.344**
G - General Learning Ability	102.2	14.0	68-143	.331**
V - Verbal Aptitude	104.1	15.2	70-145	.324**
N - Numerical Aptitude	105.4	14.2	63-137	.248*
S - Spatial Aptitude	98.8	17.6	61-143	.194*
P - Form Perception	107.9	15.8	67-143	.067
Q - Clerical Perception	117.9	13.5	93-156	.271**
K - Motor Coordination	114.8	16.1	72-149	.205*
F - Finger Dexterity	105.1	17.3	59-145	.104
M - Manual Dexterity	104.2	20.0	62-171	-.044

*Significant at the .05 level.
**Significant at the .01 level.

Criterion:

Supervisory ratings. Criterion data were collected in 1958 and 1961.

Design:

Concurrent (test and criterion data were collected at approximately the same time).

Concurrent Validity:

Phi Coefficient = .31

Effectiveness of Norms:

Only 63% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-329R norms

78% would have been good workers. Thirty-seven percent of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the S-329 norms, only 22% would have been poor workers. The effectiveness of the norms when applied to this independent sample is shown graphically in Table 8.

TABLE 8

Effectiveness of S-329R Norms
on Check Study Sample #2490

	Without Tests	With Tests
Good Workers	63%	78%
Poor Workers	37%	22%

TABLE 9

Concurrent Validity of S-329R Norms

On Check Study Sample #2490

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	22	43	65
Poor Workers	26	12	38
Total	48	55	103

Phi Coefficient (ϕ) = .31
Chi Square (X^2Y) = 10.2
Significance Level = $P/2 < .005$

CHECK STUDY RESEARCH SUMMARY SHEET FOR S-329

S-329 GATB Study #2800
Clerk, General Office (clerical) 219.388-066

Check Study #2 Research Summary

Sample:
89 (1 male and 88 female) MDTA Clerk, General Office trainees enrolled at various facilities in Minnesota. Four individuals were identified as Negroes, one as Oriental, and the remaining 84 were non-minority group members.

TABLE 10

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with Criteria 1 (Instructor's broad category ratings (r_1) and criteria 2 (combined speed and error typing test scores (r_2) for Age, Education and Aptitudes of the GATB N=89

	Mean	SD	Range	r_1***	r_2
Age (years)	29.3	11.2	17-55	.040	-.132
Education (years)	11.5	1.2	8-14	.261*	.198
Cultural Exposure #	2.4	1.0	1-5	-.018	.035
G - General Learning Ability	105.5	11.9	69-136	.412**	.353**
V - Verbal Aptitude	105.4	13.9	82-141	.282**	.176
N - Numerical Aptitude	105.7	12.9	59-132	.481**	.419**
S - Spatial Aptitude	105.5	15.0	65-143	.018	.145
P - Form Perception	112.5	17.2	55-149	.219*	.324**
Q - Clerical Perception	118.5	14.3	70-156	.377**	.377**
K - Motor Coordination	104.8	13.2	80-144	.231*	.308**
F - Finger Dexterity	99.9	17.6	56-137	.115	.175
M - Manual Dexterity	99.1	20.4	53-164	.125	.144

*Significant at the .05 level.
**Significant at the .01 level
***Corrected for criterion variable expressed in broad categories.
N = 81

Criterion:

Multiple hurdle of broad category ratings and combined speed and error typing score. Criterion data were collected in 1968 and 1969.

Design:
Concurrent (test and criterion data were collected at approximately the same time).

Concurrent Validity:

Phi Coefficient = .30

Effectiveness of Norms:

Only 51% of the nontest-selected trainees used for this study were good trainees; if the trainees had been test-selected with the S-329

norms 64% would have been good trainees. Forty-nine percent of the nontest-selected trainees used for this study were poor trainees; if the trainees had been test-selected with the S-329 norms, only 35% would have been poor trainees. The effectiveness of the norms when applied to this independent sample is shown graphically in Table 11.

TABLE 11

Effectiveness of S-329 Norms
on Check Study Sample # 2800

	Without Tests	With Tests
Good Trainees	51%	64%
Poor Trainees	49%	35%

TABLE 12

Concurrent Validity of S-329 Norms

On Check Study Sample # 2800

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Trainees	9	36	51
Poor Trainees	24	20	49
Total	33	56	89

Phi Coefficient (ϕ) = .30
Chi Square (X^2Y) = 7.9
Significance Level - $P/2 < .005$

SP-21

A-P-P-E-N-D-I-X

DESCRIPTIVE RATING SCALE
(For Aptitude Test Development Studies)

Score____

RATING SCALE FOR _____
D. O. T. Title and Code

Directions: Please read Form SP-20, "Suggestions to Raters", and then fill in the items listed below. In making your ratings, only one box should be checked for each question.

Name of Worker (print) _____
(Last) (First)

Sex: Male_____ Female_____

Company Job Title: _____

How often do you see this worker in a work situation?

☐ See him at work all the time.

☐ See him at work several times a day.

☐ See him at work several times a week.

☐ Seldom see him in work situation.

How long have you worked with him?

☐ Under one month.

☐ One to two months.

☐ Three to five months.

☐ Six months or more.

A. How much work can he get done? (Worker's ability to make efficient use of his time and to work at high speed.)

☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.

☐ 2. Capable of low work output. Can perform at a slow pace.

☐ 3. Capable of fair work output. Can perform at an acceptable but not a fast pace.

☐ 4. Capable of high work output. Can perform at a fast pace.

☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

☐ 1. Performance is inferior and almost never meets minimum quality standards.

☐ 2. The grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.

☐ 3. Performance is acceptable but usually not superior in quality.

☐ 4. Performance is usually superior in quality.

☐ 5. Performance is almost always of the highest quality.

C. How accurate is he in his work? (Worker's ability to avoid making mistakes.)

☐ 1. Makes very many mistakes. Work needs constant checking.

☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.

☐ 3. Makes mistakes occasionally. Work needs only normal checking.

☐ 4. Makes few mistakes. Work seldom needs checking.

☐ 5. Rarely makes a mistake. Work almost never needs checking.

D. How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

☐ 1. Has very limited knowledge. Does not know enough to do his job adequately.

☐ 2. Has little knowledge. Knows enough to "get by."

☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.

☐ 4. Has broad knowledge. Knows enough to do good work.

☐ 5. Has complete knowledge. Knows his job thoroughly.

E. How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

☐ 1. Has great difficulty doing his job. Not at all suited to this kind of work.

☐ 2. Usually has some difficulty doing his job. Not too well suited to this kind of work.

☐ 3. Does his job without too much difficulty. Fairly well suited to this kind of work.

☐ 4. Usually does his job without difficulty. Well suited to this kind of work.

☐ 5. Does his job with great ease. Exceptionally well suited for this kind of work.

F. How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations efficiently.

☐ 3. Can perform several different operations with reasonable efficiency.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

G. How resourceful is he when something different comes up or something out of the ordinary occurs? (Worker's ability to apply what he already knows to a new situation.)

☐ 1. Almost never is able to figure out what to do. Needs help on even minor problems.

☐ 2. Often has difficulty handling new situations. Needs help on all but simple problems.

☐ 3. Sometimes knows what to do, sometimes doesn't. Can deal with problems that are not too complex.

☐ 4. Usually able to handle new situations. Needs help on only complex problems.

☐ 5. Practically always figures out what to do himself. Rarely needs help, even on complex problems.

H. How many practical suggestions does he make for doing things in better ways? (Worker's ability to improve work methods.)

☐ 1. Sticks strictly with the routine. Contributes nothing in the way of practical suggestions.

☐ 2. Slow to see new ways to improve methods. Contributes few practical suggestions.

☐ 3. Neither quick nor slow to see new ways to improve methods. Contributes some practical suggestions.

☐ 4. Quick to see new ways to improve methods. Contributes more than his share of practical suggestions.

☐ 5. Extremely alert to see new ways to improve methods. Contributes an unusually large number of practical suggestions.

I. Considering all the factors already rated, and <u>only</u> these factors, how acceptable is his work? (Worker's "all-around" ability to do his job.)

☐ 1. Would be better off without him. Performance usually not acceptable.

☐ 2. Of limited value to the organization. Performance somewhat inferior.

☐ 3. A fairly proficient worker. Performance generally acceptable.

☐ 4. A valuable worker. Performance usually superior.

☐ 5. An unusually competent worker. Performance almost always top notch.

July 1970 S-329

FACT SHEET

Job Title: Clerk, General Office (clerical) 219.388-066

Job Summary: Performs a wide range of the following clerical duties: Files correspondence, records and reports; types letters and reports; prepares customers bills; computes payrolls; operates adding machine, calculator or other office machines; compiles reports; addresses mail; takes dictation; sorts and distributes mail; tabulates and posts data in record books; keeps inventory; and gives information to callers.

Work Performed: Files correspondence, records and reports: Sorts, arranges, and files alphabetically, numerically, chronologically or by subject matter, etc.; locates and removes material from file upon request; prepares necessary charge-out records, cards, etc.

Types letters; fills in forms, reports, cards; and cuts stencils. (Information to be typed is obtained from longhand or typewritten copy.) Writes or types names and addresses on envelopes, cards and labels.

Prepares bills, statements and invoices from original orders, sales, charge slips or other records. Types or writes on printed form customer's name, address, account and/or order number, items, prices, discounts and totals. May calculate amounts to be entered on bills. May address envelopes and insert bills in envelopes.

Computes workers' earnings by totaling entries on timekeeper's reports, time cards or work tickets; enters worker's name, working days, time rate, deductions and total wages due on payroll sheets.

Adds and subtracts groups of figures by pressing proper keys on an electrically driven or lever-operated adding machine; writes computed answer on records or reports. Operates a calculating machine by pressing proper keys and manipulating levers to add, subtract, multiply and divide. May calculate figures on pay records, invoices, balance sheets, etc.

Assembles records and data, arranges items systematically, performs computations, and posts data for compilation of special and periodic reports for various business operations.

Takes notes or verbatim record in shorthand or on a stenotype machine, of letters, reports or memoranda and transcribes dictated material in prescribed form using a typewritter.

Receives telephone orders for materials or merchandise, quotes prices, makes out an order sheet by listing the items requested, and sends order to proper department to be filled.

Systematically enters details of business transactions in record books and makes required computations. (May operate office machine for making computations.) Periodically totals accounts for entry into a general ledger.

Gives information regarding activities and products, location of various offices, individuals or departments, to persons coming into office.

Keeps a continuous record of supplies and/or equipment received or issued to provide information of stock on hand; lists items to be ordered. May make periodic physical counts of stock to check clerical computations.

Copies record of business transactions from sales slips, purchace invoices, cash books, etc. into special accounts.

Opens mail, stamps time received on mail, reads and sorts incoming mail, and delivers mail to proper person or department.

Effectiveness of Norms: Only 65% of the nontest-selected workers used for this study were good workers; if the workers had been test selected with the S-329 norms, 71% would have been good workers. 35% of the nontest-selected workers used for this study were poor workers; if the workers had been test selected with the S-329 norms, only 29% would have been poor workers. (Validation Sample)

Only 63% of the nontest-selected workers used for this study were good workers; if the workers had been test selected with the S-329 norms, 78 % would have been good workers. 37% of the nontest-selected workers used for this study were poor workers; if the workers had been test selected with the S-329 norms, only 22% would have been poor workers. **(Check Study #1)**

Only 51% of the nontest-selected trainees used for this study were good trainees; if the trainees had been test-selected with the S-329 norms 64% would have been good trainees. Forty-nine percent of the nontest-selected trainees used for this study were poor trainees; if the trainees had been test-selected with the S-329 norms, only 35% would have been good trainees (Check Study #2)

Applicability of S-329 Norms: The aptitude test battery is applicable to jobs which include a majority of duties described above.

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